academic work and in industry have been privileged to train a second generation of men—your chemical grandchildren—whose labours it is hoped may add further testimony to the inestimable value of your guidance and example.

As a permanent tribute of our gratitude and affection towards you and in grateful remembrance of all your kindnesses and encouragement to us, we desire, on this occasion, to present your bust to the Chemical Society of London. We trust this proposal will commend itself to you, and that it will be some pleasure to you and your children to know that such an association with the representative Chemical Society of this country will be established for all time.

We sincerely wish that you may be spared to enjoy further years of good health, happiness, and activity.

The address had been signed by about 140 of Sir Henry's former students, many of whom now occupy responsible positions both in academic work and in association with chemical industries, and are to-day distributed not only in all parts of the United Kingdom, but also in Germany, Russia, Canada, the United States of America, Australia, South Africa, and Japan.

Sir Edward Thorpe then unveiled the bust of Sir Henry Roscoe, and on behalf of the subscribers asked the president of the Chemical Society to accept it as a permanent memento from Sir Henry's former students of his lifelong association with, and interest in, the welfare of the society. Sir Edward also extended to Mr. Albert Drury, R.A., the thanks of the committee for the excellent and striking likeness that he had secured. He also asked Sir Henry to accept as a further memento from his students a replica of the bust for himself and the members of his family, which was in course of preparation.

The gift to the Chemical Society was acknowledged by the president, Prof. W. H. Perkin, F.R.S., who said he felt sure that it would be a great pleasure to the members of the council and to the fellows of the society to place the bust in a fitting position in their rooms, where they would always value it as a token of the great admiration and affection they all had for Sir Henry Roscoe. He also expressed to Sir Henry Roscoe the appreciation of the fellows of the society for his continued interest in the society, and for the valuable donations that he had given them, especially in connection with their library.

Sir Henry Roscoe, in acknowledging the gifts both to himself personally and to the Chemical Society, expressed the great pleasure that it gave him to be present, and to say how deeply touched he was by this renewed expression of esteem and affection thus shown to him by his old pupils.

"No honours, no rewards, can, I think," he said, "compare with this, and to these men, whom I like to look upon as my scientific sons, come my heartfelt thanks. To their kindness rather than to my own deserts is this fresh recognition due, for looking back over my fourscore years of life, I see how small the deeds, great though the will may have been. To you, Sir Edward Thorpe, as chairman of the committee, as well as to Dr. Charles Keane, the secretary, and to the other members of the committee, my special thanks are due. I thank the Chemical Society through you, Mr. President, for the great honour it has done me by placing my effigy in its library. I cannot flatter myself that the coming generation of fellows of the Chemical Society will look upon my face with the veneration with which they will gaze on the features of the great masters whose busts adorn your walls, but if the sight of this one recalls to their memory that this was a man who loved his science, his teaching, and his students, and if that sight helps to imbue them with a like love, then perhaps my bust in your library may be of some use. Now, my friends, I thank you all, and wish you all God-speed."

NOTES.

WE regret greatly to announce that Sir Robert S. Ball, F.R.S., Lowndean professor of astronomy and geometry in the University of Cambridge, and director of the Cambridge Observatory, died on Tuesday, November 25, at seventy-three years of age.

THE Home Secretary has appointed a Committee to inquire what action has been taken under the Wild Birds Protection Acts for the protection of wild birds, and to consider whether any amendments of the law or improvements in its administration are required. The members of the Committee are:—The Hon. E. S. Montagu, M.P., Under-Secretary of State for India (chairman); Lord Lucas, Parliamentary Secretary to the Board of Agriculture; Mr. Frank Elliott, of the Home Office; Mr. E. G. B. Meade-Waldo, Mr. W. R. Ogilvie Grant, and Mr. Hugh S. Gladstone. The secretary to the Committee is Mr. H. R. Scott, of the Home Office, to whom any communications on the subject of the inquiry may be made.

THE death is announced, at fifty-one years of age, of Mr. H. F. B. Lynch, well known by his extensive travels in the Middle East for purposes of scientific, political, and commercial research.

AN exhibition of one hundred and forty of the remarkable series of photographs, greatly enlarged, taken by Mr. H. G. Ponting during the British Antarctic Expedition of 1910–13, will be opened on Wednesday next, December 3, at the Fine Art Society, 148 New Bond Street, London, W.

THE death is announced, in his fortieth year, of Dr. Ora W. Knight, who had been consulting chemist and assayer to the State of Maine since 1903. He had previously been assistant chemist at the Maine experiment station for several years. Dr. Knight was known as an ornithologist and a botanist; he was the author of a standard book on the birds of Maine, and his herbarium contained a nearly complete collection of the plants of that State.

THE death is announced of the veteran Italian geologist, Prof. Igino Cocchi, of Florence. He was born in 1828, and was one of the most active pioneers in stratigraphical geology in Italy. In 1867 he became the first president of the committee directing the Geological Survey of Italy, which he had been mainly instrumental in founding. Some of his studies were made in England, and he was elected a foreign correspondent of the Geological Society of London in 1874.

THE Smithsonian Institution announces the following changes in the *personnel* of the department of geology, United States National Museum:—Dr. E. T. Wherry, late assistant professor of mineralogy at Lehigh University, has been appointed assistant curator of mineralogy and petrology in succession to Mr. Joseph E. Pogue, transferred to the United States Geological Survey; Dr. J. C. Martin has been appointed assistant curator of physical and chemical geology in succession to Mr. C. G. Gilbert, appointed curator of mineral technology.

A MEETING of the council of the Zoological Society of Scotland has just been held, at which a very satisfactory report was made on the working of the Zoological Park for the period during which it has been open. Since the end of July, when the park was opened to the public, 102,233 visitors have entered, while the receipts at the gate for the three and a half months have resulted in a surplus of about 1000*l.*, after paying the expenses of upkeep for five months. The number of specimens received during the period was 420; the health of the stock is excellent, and the death-rate has been very light. Twenty new fellows were admitted, and the number of fellows on the roll now exceeds 2000.

WE are glad to see that the scale of charges for the services of the official guide appointed a short time ago to conduct parties of visitors round the collections contained in the garden, plant-houses, and museums of the Royal Botanic Gardens, Kew, and to point out objects of particular botanical interest, has been greatly reduced. Hitherto the scale of charges has been 2*s.* 6*d.* for each person attending a morning tour, and 1*s.* for each person attending an afternoon tour, but in future these charges are to be 6*d.* and 3*d.* respectively. These charges are so low that no one need now be deterred from participating in the instructive tours around the gardens taken by the guide daily.

DR. H. BAYON, research bacteriologist to the Union Government of South Africa, gave a lecture at the Royal Society of Medicine on November 20, on the leprosy problem in the British Empire. He pointed out that the latest returns showed that in India the leper population had increased from 100,000 to 110,000. Dealing first with treatment, Dr. Bayon stated that in selected cases a vaccine prepared with certain cultures had given promising results. He finally urged that it is the duty of every Government to prevent the further spread of leprosy by the use of all the means of preventive medicine, and, in particular, by the institution of a system of universal segregation of all lepers.

IN connection with a suggested removal of the statue of Charles I. at Charing Cross, *The Field* of November 15 directs attention to the interest attaching to the "great horse" on which the King is mounted. These "great horses," one of which is represented in a picture by Vandyke in Buckingham Palace, executed from an animal in the Royal stables, "were the direct descendants of the Italian horses Altobello and Governatore . . . sent over to the stud at Hampton Court by the Marquis of Mantua as a present to King Henry VIII., and the breed was still further improved by the two splendid Spanish horses sent to King Edward VI. by Charles V. in 1552, which were of the type shown in the well-known sketches by Rubens."

PARTICULARS of the Pierre J. and Edouard Van Beneden prize of 2800 francs are given in the Bulletin of the Royal Academy of Belgium (Classe des Sciences, 1913, No. 7). The prize is to be awarded every three years to the Belgian or foreign author or authors of the best original work of embryology or cytology written or published during the three years preceding the date on which competing theses must be received. For the first competition this date is December 31, 1915. The manuscript works may be signed or anonymous, and the French, German, or English language may be employed. Authors should send their contributions, duly stamped, to the permanent secretary of the Academy, Palais des Académies, Brussels, inscribed "Concours pour le Prix Pierre-J. et Edouard Van Beneden."

THANKS largely to the kindness of the Percy Sladen Trust, an expedition left Perth, West Australia, a few days ago, for the Abrolhos Islands. The group is situated about forty miles out in the Indian Ocean from the coast of Western Australia, and roughly 300 miles north of Perth. The expedition has been organised by Prof. W. J. Dakin, of the new University of Western Australia, and accompanying him is Mr. W. B. Alexander, of the Perth Museum. From many points of view this little group of islands is of great interest. The wreck of the Dutch East India Co.'s ship, *The Batavia,* under the command of Capt. Pelsart, in 1629, is said to have led to the first recorded discovery of Australia. Whether true or no, the mutiny of part of the wrecked crew and the story of their final capture is worthy of any fiction. Plutonic rocks occur in one of the island groups, but the others are coral formations. It is said that not only does the terrestrial fauna bear interesting relations to the mainland, but that the intervening forty miles of sea separate two totally distinct marine faunas. Whilst the coastal fauna at this latitude is temperate, the island marine fauna is understood to be tropical. The members of the expedition intend making a close investigation of the fauna and flora of the islands and surrounding reefs. The material collected will be reported upon in the usual way by specialists.

DR. ANTON FRITSCH, director of the natural history departments of the Royal Bohemian Museum, and for many years professor of zoology in the Royal Bohemian University, died after a brief illness at Prague on November 15, aged eighty-one. Dr. Fritsch's first published work (1851) was a list of the Bohemian, German, and Latin names of the birds found in Bohemia; and throughout his life he took the deepest interest in the local fauna, making many contributions to knowledge, especially of the birds and fishes. In 1891 he founded a small station for the special study of the fresh-water fauna of the Bohemian lakes. Dr. Fritsch will be best remembered, however, by his numerous researches on the fossils of the Permian and Cretaceous formations of Bohemia, the results of which were published in several volumes. His "Fauna der Gaskohle" (1879–1901) will always remain a standard work of reference on the early Labyrinthodont Amphibia, and it forms a monument to his patient industry. Most of the fossils described were pyritised and unfit for study and preservation in the ordinary manner. Dr. Fritsch therefore cleaned away all the petrified material, leaving only the casts in the shale from which he took clear impressions by an electrotype process. He was thus able to make good use of specimens which at first sight appeared of little value. His enthusiasm made him an inspiring teacher, and he has left several pupils who are diligently prosecuting the researches he suggested to them. Dr. Fritsch was a foreign member of the Geological Society of London, from which he received the Lyell medal in 1902.

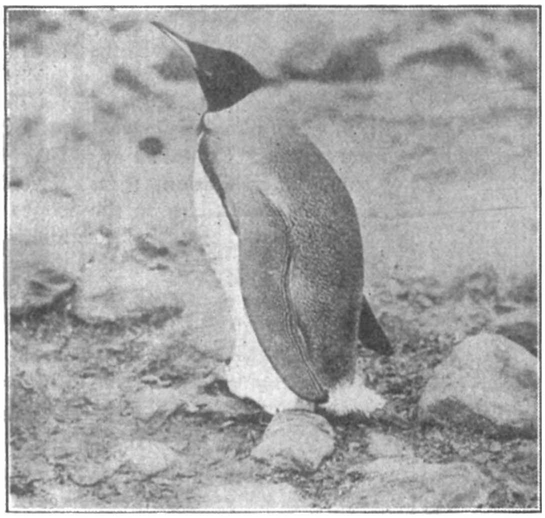
NATURAL philosophy in general and palæontology in particular have lost an ardent disciple and a zealous worker by the death of Henry Potonié at Berlin on October 28. He was born November 16, 1857, in Berlin, where from 1878–81 he studied botany, becoming in 1880 assistant in the Botanic Garden, and scientific "Hilfsarbeiter" in the museum. His association with the garden is marked by a descriptive account of the plant-geographical arrangement of its contents by Prof. Engler, which Potonié published in 1890. A more important botanical work was the "Illustrated Flora of North and Central Germany," issued in 1885, and subsequently in several enlarged editions. In 1885 Potonié became associated with the Prussian Geological Survey, and from that time onwards palæobotany claimed the greater share of his activities. In 1887 he published a comparative anatomical study of recent Pteridophytes and of *Cycas revoluta,* with the view of the determination of the fossil species of the older formations. This was the first of a long series of important papers bearing on fossil botany published by the Geological Survey. In 1891 he became professor of palæobotany at the School of Mines (Bergakademie), and in 1897–9 appeared the well-known text-book, "Lehrbuch der Pflanzenpalæontologie," on a new edition of which he was working immediately before his last illness. His valuable work, "On the Origin of Coal and other Combustible Minerals," is based on a course of his lectures. In 1901 he was appointed "Landesgeologe," and also joined the teaching staff of the University. He was the founder of the *Naturwissenschaftliche Wochenschrift,* with which he was associated for twenty-four years, and of which he was editor at the time of his death; a recent number has a short appreciation and good portrait. During his last illness he received the honour of Geheim-Bergrat.

THE October issue of *The National Geographic Magazine* is largely devoted to an article, illustrated by a fine collection of photographs, of a journey by Mr. G. Kennan through the eastern portion of the province of Daghistan, in the south-eastern corner of European Russia, between the Black Sea and the Caspian. He describes the splendid mountain scenery, the result of the intrusion of igneous rocks on the sedimentary strata, the whole worn down and torn into precipitous ravines by subsequent denudation. The population is of the most varied character—Aryan, Arab, Tartar, Crusader, and refugees from the adjoining regions have left their mark. Many individuals, if dressed in the costume of western Europe, would certainly be taken for Englishmen, Scotchmen, Bavarians, or Saxons. The homes often assume the character of the pueblos or cliff-dwellings of New Mexico. The peoples speak some thirty languages, with numerous dialects. The prevailing religion is Islam. Many archaic customs and a primitive tribal organisation survive, but Russian domination and the extension of education tend to promote the growth of uniformity.

CAPTAIN H. G. LYONS brought the subject of relief in cartography before the research meeting of the Royal Geographical Society on November 20, indicating that British contributions to this important branch of cartography are not numerous. He discussed the relative value of contours, hachures and coloured shading, and their utility as measured by their applicability to different kinds of map. He summarised the limits of scale within which each method best serves its purpose, and showed reasons why, outside these limits, one method or another fails to fulfil its function properly. Such a summary should form a valuable guide to cartographers, although when the author stated that hachuring becomes "conventional" on a scale smaller than about 1 : 500,000, because this this scale so compresses ridge and valley in mountainous regions, he might have been taken to task by the artist of such a map as the Swiss sheets in "Stieler" (1 : 925,000), who might have suggested that convention is to be distinguished from careful generalisation. The author also brought out the limitations of contour systems in portraying gently undulating ground—a point which the student often has need to remember. He dealt at length with various systems of colouring used in conjunction with contours, and discussed the basis of "physiological optics," on which the selection of colours for this purpose ought to rest.

DR. AND MRS. WORKMAN gave the Royal Geographical Society, at its meeting on Monday, November 24, an account of their further explorations, conducted last year, among the Karakoram Himalayas. Their objective on this occasion was the Siachen or Rose Glacier. Mrs. Workman indicated the course of their journey, and gave an account of their additions to the map of the region, incidentally controverting the views of previous visitors on several points. The surveyor who accompanied the party was Mr. C. Grant Peterkin. To the pass at the head of the Bilaphond Glacier Mrs. Workman applies the name of the glacier itself, and not that of Saltoro. attached to it as "traditional" by Dr. Longstaff. She dealt with the same explorer's high peak of Teram Kangri, which he gave as 27,610 ft. high, while Mr. Peterkin made it only 24,560 ft. She observed for the first time a group of lofty peaks behind the east Siachen wall, on the Turkestan side, which form additions to the map, and others from the Silver Throne plateau, to the highest of which (24,350 ft.) the name of Queen Mary was given. The possibility of the Siachen glacier having provided an old route into Chinese Turkestan was considered and dismissed, in spite of the discovery of remains of rude buildings at high altitudes. Dr. Workman dealt in detail with the geology of the region and the character and work of the glaciers; his paper was perhaps of most notable interest in the paragraphs which described the junction of "probably the largest existing valley tributary outside the polar regions . . . with the largest known valley glacier." These are the Tarim Shehr (two miles wide) and the Siachen, which is 2¾ miles wide just above the junction. The two are compressed into the width of the main valley below the junction.

To the October number of the American Museum Journal Mr. R. C. Murphy communicates a graphic and richly illustrated account of his experiences among the petrels, penguins, and sea-elephants of South Georgia during a visit to that desolate island undertaken on behalf of the museum and the Brooklyn Institute, much interesting information being also given with regard to the eight whaling stations on the island. One of the most interesting photographs (here reproduced) shows a king-penguin incubating its single egg, which is supported on the instep, where it is covered by a fold of the skin on the under surface of the body, the bird standing all the time in the upright posture, and the two sexes relieving one another in the duties of incubation. Although the whales are stated not to show at present serious signs of diminution in number, in spite of the rapid rate at which they are being killed off, the prospects of the sea-elephants appear deplorable. "Slow, unsuspicious, gregarious, they can be hunted profitably until the last one has gone to his ancestors, and the calamity of the Antarctic fur-seal is repeated." The fate of these gigantic seals depends, then, it would seem, on the results of the investigation now being conducted on behalf of the Colonial Office.


A king-penguin incubating its egg.

IN *The American Naturalist* for October (vol. xlvi., p. 577) Dr. R. Pearl discusses the measurement of the intensity of inbreeding. He points out the principles which must govern such an attempt, and shows that it is possible to find a coefficient by which the amount of inbreeding can be represented, so that different cases can be compared. The coefficient is based on the ratio of the actual to the possible number of ancestors in any generation, and therefore indicates the amount of inbreeding for a given number of generations back. The latter part of the paper discusses the differences between close inbreeding in bisexual reproduction and self-fertilisation of hermaphrodites, and shows that in some important respects the two are not comparable. An abstract, with some new material, is published in Bull. 215, Maine Agricultural Experiment Station.

A CRITICAL study of the conditions connected with the preparation of plantation para rubber has been made by Mr. B. J. Eaton, and the results of the inquiry are presented in Bulletin No. 17 of the Department of Agriculture, Federated Malay States. The endeavour of the author has been to collect as much trustworthy information as possible on the quality of rubber prepared by different methods and under different conditions so that such knowledge can be applied in indicating the causes underlying defects of rubber samples coming on the market. The effect of various coagulants and of dilution of the latex, period of coagulation, inhibitive substances, metal salts, light, and of micro-organisms on the quality of the rubber is dealt with at length. The use of sodium bisulphite as a means of inhibiting the action of oxidases and to ensure the production of light-coloured rubber has been found to be effective and profitable.

IN the current *Bulletin de la Société d'Encouragement pour l'Industrie Nationale,* A. Granger gives an interesting outline of the rise and fall of the manufacture of *porcelaine tendre,* usually called "fritted" or "soft" porcelain. It seems to have been first made in Rouen, about 1673. The body of soft porcelain in its best days appears to have been made from an artificial glass (frit) mixed with a marl from Argenteuil; and after the body was fired it was covered with a plumbiferous glaze. This ware lent itself to particularly pleasing decorative effects, and the Sèvres factory made this variety of porcelain famous. The "narrow margin of safety" in manufacture led to a particularly large percentage loss. Possibly owing to changes in the character of the raw materials, &c., the losses finally became so great that the manufacture had to be abandoned, and soft porcelain was ousted by the regular type of "continental porcelain"—the so called *porcelaine dure,* or "hard" porcelain. The body of this type of ware is made from a mixture of felspar, clay, and quartz, and glazed with a felspathic glaze. Unlike soft porcelain, the glaze and body of hard porcelain are fired in one operation. Mr. Granger gives some old recipes and describes some interesting recent attempts to revive the manufacture of soft porcelain at Sèvres.

WE have received several further letters from Mr. S. L. Walkden complaining about the statement in our review of his "Aëroplanes in Gusts," which was corrected by him in his letter to NATURE of October 30. In reference to this matter the reviewer writes:—"I should have thought that Mr. Walkden's letter, together with my lengthy quotation from his book, would have been more than sufficient to remove any injustice that might have arisen through a statement of claim being made in the reviewer's and not the author's words. At the same time, it is necessary to warn readers that the amended claim contained in Mr. Walkden's letter must be read in conjunction with the lengthy quotation in NATURE, or better with the contents of the book itself, otherwise a false idea may be formed of the author's treatment. The only accelerations which the air can be said to *impress* on an aëroplane in the recognised Newtonian meaning of the term, are those due to the pressures of the air on its supporting surfaces, and are measured by the accelerations which the aëroplane would undergo if no other forces acted on it, their direction being in the direction of the corresponding impressed forces. In these circumstances a gust having a downward *velocity* would impress a downward, not an upward, acceleration on the aëroplane. It will be seen that the quotations from his book in my letter contain no reference to accelerations *impressed* by air pressures on the plane in this sense, and, *while I am quite willing to accept the author's amended statement of his claims,* I should not feel justified in stating these claims in this form without his written authority."

SIX years ago Prof. O. Knoblauch, of the Technical High School at Munich, determined the specific heat of superheated steam, at constant pressures, for temperatures up to 662° F., and pressures up to 124 lb. per sq. in. These experiments were conducted on a scale which directly appeals to the engineer, and the results, which Prof. Knoblauch obtained in conjunction with Dr. Max Jakob, are accepted largely by engineers. *Engineering* for November 7 contains an account, with drawings of the apparatus employed, of further experiments by the same investigators. Knoblauch has extended the range to 1020° F., up to pressures of 114 lb. per sq. in., and the experiments are being continued at higher pressures up to twenty atmospheres. Jakob has attempted to check the results by calculating the specific volume of steam, for the same high range of pressures and temperatures, from the experiments of Knoblauch and his collaborators, and also from the deductions of H. N. Davis, and by comparing these volume results with those directly determined. The research shows that the specific volume can be calculated from the specific heat, and the experimental values for the specific heat are thus confirmed. The general result is that the specific heat of steam at constant pressure increases with pressure, especially near the saturation line, though much less so, and scarcely at all finally, as the degree of superheating is raised. As the temperature rises, the specific heat, c_p, decreases to a minimum, to increase again slightly.

THE Cambridge University Press has recently made further additions to the "Cambridge Manuals of Science and Literature." The series now numbers eighty volumes, and its general excellence, to which attention has been directed on former occasions, is well maintained by the half-dozen books which have just been received. Three of the new volumes deal with biological subjects. Prof. G. H. Carpenter tells "The Life-Story of Insects," and provides an outline sketch of the facts and meaning of insect transformations. Prof. W. J. Dakin, in his little book on "Pearls," give a summary of the most important facts about pearls, pearl fishing, and pearl formation. The third biological topic is handled by Mr. H. Russell, who writes on "The Flea," and his book, which is, he thinks, the first in English devoted wholly to the subject, will prove particularly useful now that it is known that fleas are the active agents in spreading plague. Dr. E. J. Russell contributes a book on "The Fertility of the Soil," which is addressed to all who are keenly interested in the soil they are cultivating and want to know something more about it. Prof. A. H. Gibson, under the title, "Natural Sources of Energy," discusses the problem of forecasting the conditions of life and activity in future centuries. The sixth book, on "The Peoples of India," is by Mr. J. D. Anderson, who gives a popular account of the race and caste, the languages, and the religions of the various peoples in our Indian Empire.

MR. REGINALD CORY has received permission of the King to dedicate to his Majesty the volume, entitled "The Horticultural Record," which is to be published next month by Messrs. J. and A. Churchill. The work will contain numerous plates, coloured and half-tone, reproduced from photographs taken at the Royal International Horticultural Exhibition, 1912. Several well-known writers contribute articles on the progress of horticulture since the first international exhibition in 1866.

MESSRS. LONGMANS, GREEN AND CO. have in preparation "Chemistry of the Radio-Elements, Part ii., The Radio-Elements and the Periodic Law," by Mr. Frederick Soddy, F.R.S. This is an extension of the original monograph, and covers recent generalisations connecting the radio-active disintegration series with Mendeléeff's table.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES FOR DECEMBER :—

Dec. 1. 22h. 1m. Uranus in conjunction with the Moon (Uranus 3° 9′ N.).
2. 3h. 0m. Mercury stationary.
,, 8h. 5m. Mercury in conjunction with Venus (Mercury 1° 34′ N.).
6. 21h. 0m. Saturn at opposition to the Sun.
10. 12h. 0m. Mercury at greatest elongation W. of the Sun.
12. 15h. 58m. Saturn in conjunction with the Moon (Saturn 6° 45′ S.).
15. 9h. 57m. Mars in conjunction with the Moon (Mars 0° 59′ S.).
,, 18h. 36m. Neptune in conjunction with the Moon (Neptune 4° 29′ S.).
20. 9h. 44m. Variable star, Algol, at minimum.
21. 22h. 35m. Sun enters sign of Capricornus. Solstice.
23. 6h. 33m. Variable star, Algol, at minimum.
25. 20h. 23m. Mercury in conjunction with the Moon (Mercury 5° 26′ N.).